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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/042,666

01/08/2002

Nianci Han

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USA/ETCH/METAL/JB

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7590

06/24/2003

APPLIED MATERIALS, INC.
2881 SCOTT BLVD. M/S 2061
SANTA CLARA, CA 95050

EXAMINER

LAVILLA, MICHAEL E

ART UNIT

PAPER NUMBER

1775

DATE MAILED: 06/24/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
10/042,666

Applicant(s)
HAN ET AL.

Examiner
LA VILLA

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1775

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on May 13, 2002
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above, claim(s) 11-28, 39-42, and 44-46 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 29-38, 43, and 47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on Jan 8, 2002 is/are a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 2,3 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-10, 29-38, 43, and 47, drawn to a component with a Y-Al compound coating, classified in class 428, subclass 697.
 - II. Claims 11-28, 39-42, and 44-46, drawn to a method of coating a structure with a Y-Al compound coating, classified in class 427, subclass 523.
2. The inventions are distinct, each from the other because of the following reasons:
3. Inventions of Group I and of Group II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case there are multiple methods of making a Y-Al compound coated substrate/component/structure, as illustrated by the multiple species of processes claimed. Further methods of creating oxidized surfaces, such as heat treatment in an oxidizing atmosphere, would also be expected to produce the claimed articles and apparatus.

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4. ~~Because these inventions are distinct for the reasons given above and have~~
acquired a separate status in the art as shown by their different classification,
restriction for examination purposes as indicated is proper.
5. Because these inventions are distinct for the reasons given above and the
search required for Group I is not required for Group II, restriction for examination
purposes as indicated is proper.
6. With respect to Group II, two general process species are presented: (i)
anodizing (or acid treatment) in Claims 11-17 (especially Claim 15), 22, 40, and
44, classified in 427/343 or 540; and (ii) ion implanting in Claims 21, 25-28, 41,
and 46, classified in 427/529.
7. During a telephone conversation with Ashok Janah on 2 June 2003 a provisional
election was made with traverse to prosecute the invention of Group I, claims 1-
10, 29-38, 43, and 47. Affirmation of this election must be made by applicant in
replying to this Office action. Claims 11-28, 39-42, and 44-46 are withdrawn from
further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a
non-elected invention.
8. Applicant is reminded that upon the cancellation of claims to a non-elected
invention, the inventorship must be amended in compliance with 37 CFR 1.48(b)
if one or more of the currently named inventors is no longer an inventor of at
least one claim remaining in the application. Any amendment of inventorship
must be accompanied by a request under 37 CFR 1.48(b) and by the fee
required under 37 CFR 1.17(i).

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Information Disclosure Statement

9. The last item of the IDS filed on 29 April 2002 has not been considered because the described pdf file is inaccessible to the Examiner.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

11. The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 1-10, 29-38, 43, and 47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- I. Regarding Claims 1-10 and 36-38, it is unclear whether the claimed article is necessarily to be part of a substrate processing chamber or whether the claimed article is to have the intended use of a substrate processing chamber component.
- II. Regarding Claims 1, 3, 9, 10, 29, 31, and 36, it is unclear whether the term "structure" refers to a description of an integral surface coating or to a substrate on which is to be disposed an integral surface coating.
- III. Regarding Claims 1, 2, 5, 8, 29, 30, 33, 43, and 47, it is unclear what is meant by the phrase "integral surface coating." Must the atomic elements of the coating be the same as those elements of the

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~~substrate? Must it be formed in situ? Must it lack a discrete boundary~~
with the underlying material? Must there be a uniform and continuous structure? Must it lack pores and/or cracks?

IV. Regarding Claims 2 and 30, it is unclear what is meant by the phrase "anodized coating." At paragraph 37, applicant appears to attribute ordinary surface oxidation to this term. Typically, anodization refers to use of applied electric current in forming a protective coating, including oxygen-containing coatings. It is thus unclear what is to be encompassed by this claim. It is unclear whether applicant is claiming a structure in which the integral surface coating itself is formed by anodization or whether the integral surface coating is to be coated with an anodization coating.

V. Regarding Claims 9 and 10, it is unclear what is the antecedent basis of the phrase "underlying structure" as there is no previous mention of this element. There is only mentioned a "structure."

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

14. A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

15. Claims 1-3, 5, 6, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Goward USP 3,754,903. Goward teaches a turbine engine component having a superalloy substrate which is coated with the claimed Y-Al compounds. See Goward (Abstract; Figure 1; col. 2, line 42 through col. 3, line 6; and Examples 1-3).
16. Claims 1-3, 5, 6, 8, and 43 are rejected under 35 U.S.C. 102(a and e) as being anticipated by Jackson et al. USP 6,287,644. Jackson teaches a turbine engine component having a superalloy substrate coated with a Y-Al containing alloy of compositional gradient. The engine may be deemed a chamber component, wherein the substrate functions as a liner or wall. See Jackson et al. (Abstract; col. 3, lines 5-41; col. 4, lines 10-60; col. 5, lines 5-24; col. 8, line 60 through col. 9, line 16; col. 10, line 57 through col. 11, line 25; col. 13, line 48 through col. 14, line 15).
17. Claims 1-5 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Agüero et al. USP 5,807,613. Agüero et al. teaches coating a superalloy substrate with an Al-Y alloy coating layer, wherein these materials are useful for

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turbine engine components. See Aguero et al. (col. 1, lines 15-35; col. 4, lines 24-44; and Example 1).

18. Claims 1-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Morita et al. USPA 2002/0012791. Morita et al. teaches a YAG coated substrate support used in a processing chamber, wherein the YAG is plasma resistant. See Morita (Abstract; Figure 2; paragraphs 1, 2, 4, 7, 8, 13-15, 43-45, and 90).

19. Claims 1-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Murakawa et al. USP 6,447,937. Murakawa et al. teaches a YAG coated substrate support used in a processing chamber, wherein the YAG is plasma resistant. See Murakawa (Abstract; Figure 6; col. 3, line 58 through col. 4, line 13; Table 1; col. 21, line 21 through col. 22, line 5). The window functions as part of the wall of the apparatus.

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

22. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aguero et al. USP 5,807,613. Aguero et al. teaches coating a superalloy substrate with an Al-Y alloy coating layer, wherein these materials are useful for turbine engine components. See Aguero et al. (col. 1, lines 15-35; col. 4, lines 24-44; and Example 1). Aguero does not exemplify a turbine engine component. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the coated substrates of Aguero as turbine engine components as Aguero teaches they are effective for this purpose. In this configuration, the coated substrate may be deemed to function as a liner or wall.

23. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goward USP 3,754,903. Goward teaches a turbine engine component having a superalloy substrate that is coated with the claimed Y-Al compounds. See Goward (Abstract; Figure 1; col. 2, line 42 through col. 3, line 6; and Examples 1-3). Goward does not exemplify a turbine engine component. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the coated substrates of Goward as turbine engine components as Goward teaches they are effective for this purpose. In this configuration, the coated substrate may be deemed to function as a liner or wall.

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~~24. Claims 9, 10, 36, and 37 are rejected under 35 U.S.C. 103(a) as being~~

unpatentable over Jackson et al. USP 6,287,644. Jackson teaches a turbine engine component having a superalloy substrate coated with a Y-Al containing alloy of compositional gradient. See Jackson et al. (Abstract; col. 3, lines 5-41; col. 4, lines 10-60; col. 5, lines 5-24; col. 8, line 60 through col. 9, line 16; col. 10, line 57 through col. 11, line 25; col. 13, line 48 through col. 14, line 15; and Claims). Jackson does not exemplify a turbine engine component. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the coated substrates of Jackson as turbine engine components as Jackson teaches they are effective for this purpose. In this configuration, the coated substrate may be deemed to function as a liner or wall.

25. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morita et al. USPA 2002/0012791. Morita et al. teaches a YAG coated substrate support used in a processing chamber, wherein the YAG is plasma resistant. See Morita (Abstract; Figure 2; paragraphs 1, 2, 4, 7, 8, 13-15, 43-45, and 90). Morita may not exemplify a processing chamber. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the coated substrates of Morita as processing chambers as Morita teaches they are effective for this purpose. In this configuration, the coated substrate may be deemed to function as a liner or wall of the apparatus.

26. Claims 29-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hollars USP 6,365,010 in view of Morita et al. USPA 2002/0012791. Hollars

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teaches the claimed process chamber elements, including the substrate transport, in order to perform sequential deposition. See Hollars (Abstract; Figures; and col. 16, lines 26-51). Hollars does not teach the claimed Y-Al coating. Morita et al. teaches a YAG coated substrate support and other elements used in a processing chamber, wherein the YAG is plasma resistant. See Morita (Abstract; Figure 2; paragraphs 1, 2, 4, 7, 8, 13-15, 43-45, and 90). Morita does not teach the substrate transport capability of Claim 29, but rather teaches an apparatus having a fixed substrate arrangement. It would have been obvious to one of ordinary skill in the art at the time of the invention to coat the apparatus elements in the chamber of Hollars in order to provide plasma resistance capability for those elements as taught to be beneficial by Morita.

27. Claims 29-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hollars USP 6,365,010 in view of Murakawa et al. USP 6,447,937. Hollars teaches the claimed process chamber elements, including the substrate transport, in order to perform sequential deposition. See Hollars (Abstract; Figures; and col. 16, lines 26-51). Hollars does not teach the claimed Y-Al coatings. Murakawa et al. teaches YAG coated substrates for use in a processing chamber, wherein the YAG is plasma resistant. See Murakawa (Abstract; Figure 6; col. 3, line 58 through col. 4, line 13; Table 1; col. 21, line 21 through col. 22, line 5). Murakawa does not teach the substrate transport capability of Claim 29, but rather teaches a fixed substrate arrangement. It would have been obvious to one of ordinary skill in the art at the time of the invention to

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coat the plasma exposed elements of the chamber of Hollars with the coating of Murakawa in order to provide plasma resistance capability for those elements as taught to be beneficial by Murakawa.

Allowable Subject Matter

28. Claims 38 and 47 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.
29. Neither the reviewed prior art nor the prior art of record appears to teach or suggest the claimed subject matter of Claims 38 and 47. Particularly, the claimed gradient structure is not taught or suggested in combination with the other claimed elements.

CONCLUSION

30. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael La Villa whose telephone number is (703) 308-4428. The examiner can normally be reached on Monday through Friday.
31. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (703) 308-3822. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

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~~32. Any inquiry of a general nature or relating to the status of this application or~~
proceeding should be directed to the receptionist whose telephone number is
(703) 308-0661.

Michael La Villa
June 14, 2003

A handwritten signature in cursive script, reading "La Villa", written in black ink.